

**re: Application/Control Number 09/699,963
Art Unit 3663**

Electronic Kit Bag

A FLIGHT SYSTEM

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SUMMARY OF THE INVENTION - as submitted November 5, 1999

The Electronic Kit Bag

Other than through exterior suit-case like changes, organizing the contents of the standard pilot kit bag into a more manageable, user/friendly format has not been attempted. Coalescing and analyzing kit bag data electronically is a modern and sensible solution to both the problems of physical ungainliness and practical application of the standard kit bag. Additionally, the problem of aircraft control during pilot incapacitation has been inadequately addressed by any means other than self-help (oxygen use) or on-board autopilot capabilities. Heretofore there has been no device which offers a simultaneous, practical and coherent solution for either problem. The electronic, computerized portable kit bag (EKB), offers solutions to both problems in a single package.

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THE ELECTRONIC KIT BAG (EKB)

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

(delete claims 1-19)

20. (new) A portable, computerized aircraft flight system which accesses, organizes, manages, and manipulates flight data and functions, resulting in output displayed and accessible by a user, comprising:

a portable device having,

hardware with a processor; memory; data input means, for permitting said user to input data; display means for displaying data to said user; data recording and storage means; and data output means for permitting said user to output data;

a self-powering element for electrically operating said device independent of a fixed power supply;

software, including an operating system and operating program;

a data source which provides flight data in an electronic format, said data source supplying said data in an input format compatible with said portable device input means;

data delivery means for delivering said data to said portable device; and,

application software which manipulates and renders said source data,

delivering the data in a format consistent with the functionality of the device.

21. (new) The flight system of claim 20 wherein said software includes

means of accessing said flight data and functions by means of an application program interface.

22. (new) The flight system of claim 20 wherein said software comprises means of organizing said data by means of a search engine function.
23. (new) The flight system of claim 20 further comprising a communications means whereby said portable device communicates with data sources remote from said device.
24. (new) The flight system of claim 20 further comprising a communications means whereby said portable device communicates with selected data sources.
25. (new) The flight system of claim 20 further comprising a data communications means wherein the preferred embodiment is wireless.
26. (new) The flight system of claim 20 wherein said data delivery means for delivering said data to said portable device is by means of the Internet.
27. (new) The flight system of claim 20 wherein the method of rendering said flight data and functions is by means of an HTML browser format.
28. (new) The flight system of claim 20 wherein said device includes a flight planning component comprising;
a flight planning applications software program;
inputted flight plan data; and,
a continuous data update capability.
29. (new) The flight system of claim 20 wherein said portable device further comprises an external power source connection capability.
30. (new) The flight system of claim 20 wherein said portable device further comprises data communications means for establishing data communication links between said portable device and disparate data sources.

31. (new) The flight system of claim 20 wherein said portable device further comprises a means of ascertaining position.
32. (new) The flight system of claim 20 wherein said portable device further comprises a means of terrain mapping.
33. (new) The flight system of claim 20 wherein said portable device further comprises means permitting the user to access and manipulate said data and programs by means of peripheral devices comprising;
peripheral ports;
peripheral hardware; and,
peripheral device drivers.
34. (new) The flight system of claim 20 wherein said portable device further comprises a means of attaching the device to an aircraft, comprising;
a means of securing said device to the aircraft;
a means of allowing the user to view said device's display
while said device is attached to the aircraft; and
a means of removing said device from said attachment device.
35. (new) The flight system of claim 20 wherein said portable device further comprises a means of attaching said computer and associated power supply to an aircraft, comprising;
a means of securing said device and said power supply to the aircraft;
a means of allowing the user to view said device's display
while said device and said power supply are attached to the aircraft; and,
a means of removing said device and power supply from said attachment device.

36. (new) The flight system of claim 20 wherein the portable device further comprises a timing mechanism.
37. (new) The flight system of claim 20 wherein said programs specifically include application program interfaces and search engine routines as the means of relating and aggregating data.
38. (new) The flight system of claim 20 which includes construction characteristics resembling a tablet or other forms consistent with the intended use.
39. (new) The flight system of claim 20 wherein said portable device is attached to vehicles other than aircraft.
40. (new) A portable, computerized aircraft flight system which accesses, organizes, manages, and manipulates disparate data and functions, resulting in output accessible by a user, comprising:
- a portable device having,
 - hardware with a processor; memory; data input means, for permitting a user to input disparate data; display means for displaying data to a user; data recording and storage means; data output means for permitting a user to output data;
 - a power source comprising one or more batteries and an external power connection capability;
 - software, including an operating system, and program, application software, and,
 - a means of docking the device to the aircraft whereby said portable device becomes an operatively interconnected component of the aircraft.

41.(new) The flight system of claim 40 wherein said portable device includes a means of docking the device to the aircraft whereby said portable device becomes an operatively interconnected component of the aircraft, comprising;
a hardware docking assembly on the portable device;
a hardware docking assembly on the aircraft, whereby, when
connected the device and aircraft may exchange data and
respond to user input as an integrated unit; and,
an interconnect whereby the device can optionally share the aircraft's
power source.

42. (new) The flight system of claim 40 wherein said portable device includes a means of docking the device to the aircraft whereby said portable device becomes an operatively interconnected component of the aircraft, comprising;
a hardware docking assembly on the portable device;
a hardware docking assembly on the aircraft;
a computer on the aircraft which sends and receives data,
transmitting between it and said portable device when docked,
comprising;
a communication means between said portable
device and said aircraft computer; and,
associated software.

43. (new) The flight system of claim 40 wherein said portable device includes a means of docking the device to the aircraft whereby said portable device becomes an operatively connected component of the aircraft, comprising;
a hardware docking assembly on the portable device;
a hardware docking assembly on the aircraft;
a computer on the aircraft which sends and receives data
transmitted between it and said portable device, comprising;
a communication means between said
portable device and said aircraft computer;

associated communications software; and,
a means of controlling moveable aircraft components, comprising;
software which sends commands to designated moveable
components; and,
the aircraft's electronically responsive flights control and
operating systems.

44. (new) The flight system of claim 40 wherein said portable device receives performance and system data from the aircraft to which it is docked.
45. (new) The flight system of claim 40 wherein said portable device receives performance and system data from the aircraft to which it is docked, manipulates said data, and outputs revised data back to the aircraft thereby effecting changes in the aircraft's systems or controls by means of transferring said data electronically.
46. (new) The flight system of claim 40 wherein said portable device receives data from onboard aircraft computers by means of said docking system, manipulates said data, and similarly returns data to the aircraft for display on other aircraft computer systems or display devices.
47. (new) The flight system of claim 40 wherein the portable device is docked for use with transportation vehicles other than aircraft.
48. (new) A method whereby a user may electronically organize flight data using the steps of:
- (a) inputting data to the computing device;
 - (b) manipulating said data with an applications program;
 - (c) adding data manually or electronically from other sources as prompted;
 - (d) re-formatting and re-inputting said manipulated data automatically into another applications program;

- (e) re-inputting said further manipulated data directly into another applications program;
 - (f) continuing this process until the resultant output data is accessed in a format suitable for the flight activity queried, as determined by the string of applications programs selected;
 - (e) wherein at any point in this process the user may access the state of the data for review.
49. (new) A method whereby a user may electronically manage flight data using the steps of:
- (a) accessing data and inputting to the electronic device;
 - (b) correlating disparate data and functions according to a texotrix methodology, referring to the manipulation of data in a TEXOTRIX, where the use of the term TEXOTRIX is that of the inventor [L. *texus*, to weave, seen also in texture, textile, context and L. *-trix*, as in matrix], whereby the inputted data is arranged in an array of rows, columns and stacks, then treated as a unit using special algebraic laws facilitating the study of relations between elements, and processing this information in three dimensional levels;
 - (c) outputting said correlated data in a displayed form accessible to the user.
50. (new) A method of accessing, organizing, managing, and manipulating flight data said method comprising the steps of:
- (a) loading flight programs into a portable device;
 - (b) inputting associated flight data to said device;
 - (c) inter-relating said programs and data by means of an application program interface;
 - (d) associating the data by means of a search engine program; and,
 - (e) outputting the organized results to a user.
51. (new) A method of using a portable computer for the purpose of organizing flight data and functions, said method comprising the steps of:

- (a) acquiring input off or on-line;
- (b) linking this data to other systems and data bases by means of Application Program Interfaces; and,
- (c) and reallocating the priority of the data according to program based algorithms; and,
- (d) outputting the data.

52. (new) A method of using a portable computer for the purpose of organizing flight data and functions, said method comprising the steps of:

- (a) acquiring input off or on-line;
- (b) linking this data to other systems and data bases by means of Application Program Interfaces;
- (c) reallocating the priority of the data according to program based algorithms, thereby adding to, changing or modifying the data as necessary;
- (d) and outputting the data.

53. (new) A method for organizing flight data, comprising the steps of:

- (a) collecting disparate flight data;
- (b) inputting the disparate data into a computing device;
- (c) running the disparate data through an application program interface;
- (d) accessing the data by means of a search function;
- (e) displaying the data by means of a HTML browser.

54. (new) A method of organizing and manipulating disparate data and functions said method comprising the steps of:

- (a) inputting data to the device wherein the user will select which source(s) are necessary according to those needed to perform any given function, so that, for instance, before embarking on a flight, a user will input maps and charts, for example, by an internet upload method, while enroute the user will input weather, for example, by an ACARS connection uplink method and, while maneuvering, the user will input data, for example, via an aircraft FMS link;

- (b) said inputted data is manipulated as needed by previously loaded relational programs whereby data can be collated and organized,
- (c) said manipulated data is correlated by an application program interface;
- (d) said correlated data is grouped and sorted by a search function;
- (e) selective data is displayed;
- (f) selected data is re-inputted into selected application programs;
- (g) wherein said re-inputted data is automatically accessed for background and linking programs;
- (h) wherein said re-inputted data is manually accessed by the user for selected applications;
- (i) wherein said re-inputted data is forwarded to another application;
- (j) wherein said re-inputted data is forwarded for aircraft systems use;
- (k) wherein said re-inputted data is displayed.

55. (new) A method of organizing and manipulating disparate data and functions said method comprising the steps as follows:

- (a) the electronic computational device is started;
- (b) the user selects the browser function;
- (c) the user selects from amongst a series of icons with linking capability to, for example, a connection function, a search function, a tools function, a programs function, or a control function;
- (d) the user selects an option from the browser, in this embodiment, SEARCH FUNCTION, and opens the program;
- (e) data is inputted into the search function by the user, in this embodiment, ENGINE OUT;
- (f) a list is presented with hyperlinked options, in this embodiment, AIRSPEEDS, ALTERNATE AIRPORTS, CHECKLISTS, LANDING WEIGHTS, REPORTS;
- (g) the user selects an option, in this embodiment, ALTERNATE AIRPORTS;
- (h) a list of alternate airports is displayed;
- (i) the user selects an alternate airport;

- (j) the data about that airport is displayed with additional links to related topics and functions, in this embodiment, CALCULATE TIME TO AIRPORT, CALCULATE FUEL TO THE AIRPORT;
- (k) the user continues with the search tree, selecting another option or returning to the main menu, depending on the program and search function in use;
- (l) when the user wants to make a calculation, data is inputted into the search function by the user, for example, ENGINE OUT;
- (m) a list is presented with hyperlinked options, in this embodiment, AIRSPEEDS, ALTERNATE AIRPORTS, CHECKLISTS, LANDING WEIGHTS, REPORTS;
- (n) the user selects an option, for instance, AIRSPEEDS;
- (o) a list is presented, in this embodiment, LANDING and GO-AROUND;
- (p) the user makes a selection, such as LANDING;
- (q) a list is presented of airspeed/ landing functions, in this embodiment, REFERENCE SPEEDS;
- (r) the user selects the desired function and inputs the prompted data, in this embodiment WET/DRY;
- (s) the user continues to input prompted data, in this embodiment, WIND COMPONENT;
- (t) the system calculates and outputs the needed airspeed;
- (u) the user may continue the search tree, select another option, or return to the main menu, depending on the program and search function in us;
- (v) when the user wants to make a decision, data is inputted into the search function by the user, in this embodiment, ENGINE OUT;
- (w) a list is presented with hyperlinked options, in this embodiment: AIRSPEEDS, ALTERNATE AIRPORTS, CHECKLISTS, LANDING WEIGHTS, REPORTS;
- (x) the user selects an option, in the current embodiment, LANDING WEIGHTS:
- (y) a list is presented, in the current embodiment, CURRENT WEIGHT and CALCULATED WEIGHT

- (z) data is outputted, in this example, LANDING WEIGHT IS 500,000 POUNDS, TOO HEAVY, DUMP FUEL, wherein;
- (a') the user is presented a decision-making option, and, to continue with the example,
- (b') when a user wants to make a report, data is inputted into the search function by the user, in this example, ENGINE OUT;
- (c'), a list is presented with hyperlinked options , in this example, AIRSPEEDS, ALTERNATE AIRPORTS, CHECKLISTS, LANDING WEIGHTS, REPORTS; the user (d') the user selects an option, continuing the search string, REPORTS;
- (e') a list is presented containing, in this example, ATC, COMPANY, OTHER AIRCRAFT;
- (f') the user makes a selection, in this example, COMPANY;
- (g') and continuing as presented for each selection, so that,
- (h') when the user is presented with a screen where sending a report is required, the functioning program method will, in this embodiment;
 - aid in composing the report;
 - aid in addressing the report;
 - send the report in an email format;
 - selecting the connectivity as hardwired or wireless, depending on the connectivity selected in this particular embodiment, which may be variable, depending on the choices of hardware and software; and,
- (i') when a user wants off-line training;
- (j') data is inputted into the search function by the user, in this example, ENGINE OUT,
- (k') a list is presented with hyperlinked options, as discussed above
- (l) the user selects an option;
- (m) the selected option is outputted for study and review by the user.

Author's notes ref: claim 55:

It is reiterated here that the above discussion represents merely a sampling of optional functionalities of the Electronic Kit Bag, noting the selections of potentially accessed programs are myriad, and only partial subsets of some capabilities are here noted (for instance, a search-string can be by-passed by directly accessing a desired function), so recognizing, then, data which the user has successfully acquired by these means can be used for the purposes of flight management, and can additionally, be re-inputted, so, for instance, a value derived from a functions program can be manually or automatically re-inserted into another program, which will result in the logic loop beginning again at the input stage noted above.

56. (new) a method of utilizing a flight organizing device in transit comprising the steps of:
- (a) loading data and programs into the device at a relatively stationary site, in current embodiment, for example, on the ground or in a space station;
 - (b) operating the device at a relatively stationary site;
 - (c) loading data and programs into the device from a moving site, in the current embodiment, a vehicle;
 - (d) operating the device from a moving site, in the current embodiment, a vehicle.
57. (new) a method of managing disparate data and functions during a flight comprising the steps of;
- (a) inputting data;
 - (b) manipulating data;
 - (c) outputting data;
 - (d) displaying data;
 - (d) updating data;
 - (f) communicating data;
 - (g) continuously repeating steps (a) through (f) as the flight progresses.
58. (new) A method of managing electronic flight data comprising the steps of:
- (a) collecting an upgradeable, portable, computing device and peripherals;
 - (b) inputting flight data into the device by using upgradeable means;

- (c) managing the inputted data by using software which may be actively upgraded and revised;
- (d) interfacing disparate types of flight data and functions through the use of, application interface programs;
- (f) managing flight data with disparate connectivity by uploading it to the device wherein the device and collating it within the device;

59. (new) A method whereby a user may use the Electronic Kit Bag as an electronic version of the traditional kitbag comprising the following steps:

- (a) electronically acquiring data;
- (b) electronically managing data;
- (c) electronically manipulating data;
- (d) electronically outputting data.

60. (new) The flight system of claim 20 wherein an electronic flight system is used to manipulate an aircraft by an on-board or remote user, comprising the following steps:

- (a) electronically connecting the electronic flight system device to the autopilot system;
- (b) inputting aircraft commands into the device;
- (c) instructing the device to use translational/API strategies and programs to re-format, adjust, stack and interface the commands into the executable language of the aircraft navigation and operating systems;
- (d) outputting commands into the aircraft's navigation and operating system through the device's autopilot interface;
- (e) instructing the aircraft computers and operating systems to respond to the input commands as they would to other normal, electronic autopilot command inputs;
- (f) outputting the results of the aircraft navigation, flight and operational systems back to said electronic device,
- (g) said outputs which may then be accessed and reviewed by the user for additional inputs,

(h) thereby permitting an on-board or remote controller to manipulate a vehicle through said electronic device.

61. (new) A method of remotely controlling an aircraft comprising the steps of:
- (a) turning on the portable electronic device;
 - (b) loading a flight control management applications program;
 - (c) composing a command message;
 - (d) transmitting this command message via wireless datalink to the aircraft's FMS;
 - (f) activating the uploaded message by means of a terminal services client; and,
 - (g) executing the uploaded message by means of a terminal services client.
62. (new) A method of remotely controlling a vehicle by use of an electronic flight system device comprising the steps of:
- (a) messaging commands from the portable electronic device via communications links to a remote vehicle;
 - (b) activating said commands using a wireless terminal services client; and
 - (c) and executing these commands using a wireless terminal services client;
 - (d) thereby manipulating the motion of the vehicle.
63. (new) A method of manipulating an aircraft system from a distance, comprising the steps of:
- (a) establishing a communication link between a remote computing device and an onboard flight systems management computer;
 - (b) wirelessly up-linking command data from said device to said onboard aircraft computer;
 - (c) monitoring or manipulating the aircraft system using a remote services terminal client program.
64. (new) A method of organizing disparate flight data comprising the steps of:
- (a) inputting said data into a portable computing device;

- (b) manipulating said data by means of designated applications programs;
- (c) rendering said data in an alternate format;
- (d) and outputting said data.

65. (new) A method of organizing disparate flight data and functions and making them accessible in manageable form by a user, comprising the steps of:

- (a) uploading flight data from designated sources to a portable computing device;
- (b) inputting said flight data into said portable computing device
- (c) formatting said data into compatible languages by means of translational programs within said computing device;
- (d) inter-relating said translated data by means of search engine functions within said computational device; and,
- (e) outputting as a formatted display said organized data from the computational device to the user, or,
- (f) alternately transmitting/communicating the data to the user in another format.

66. (new) A method of accessing, organizing, managing, and manipulating flight data and functions, resulting in output accessible by a user, wherein the method results in a continuously updated output rather than a singular final product, comprising the steps of:

- (a) identifying flight data supplied by flight data sources;
- (b) transmitting/inputting said data to a portable computing device;
- (c) generating within said computing device organized formats of said inputted data;
- (d) displaying said organized formats to the device user;
- (e) updating said flight data by automatic update querying of said flight data sources;
- (f) automatically updating said data in said organized formats;
- (g) displaying said updates to the device user as they are generated.

67. (new) The method of claim 68 wherein the preferred embodiment of the transmission step is performed wirelessly.

The Electronic Flight Bag is conceived as a system that is not hardware, software, or component dependent, but rather conceptually and mechanically evolving, anticipating future incremental improvements, within the scope of the herein described purposes of the device, namely organizing, managing, manipulating, and outputting data , as well as integrating that data so that the device can be used as a portable interactive decision and support tool for flight operations, and even aircraft control. Accordingly, it is intended that this invention not be limited to these specific illustrative embodiments, but is to be interpreted within the full spirit and scope of the appended claims and their equivalents.

In summation, acknowledging that with the rapid advancement of technology, the precise hardware and software involved in this portable, this electronic flight system will evolve, but the integrity of the concept remains within the embodiment of the structure and methodology of this invention, and such variations are not to be regarded as a departure from the spirit and scope of the invention.

word: patent claims amended 07July2005